Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Sheet	1	of	7	Attorney Docket No: 030417		
1000 40	many undere do ne	, woodury)		Examiner Name MARCUS SMITH		
(Use as	many sheets as ne	ecessary)		Art Unit	2467	
STATE	EMENT BY	APPLIC	ANT	First Named Inventor	WALTON, J. Rodney	
INFOR	MATION D	ISCLOS	URE	Filing Date	2003-10-23	
				Application Number	10/693,429	
Substitute	for form 1449/PTC)		Complete if Known		

			U.S. PATENT DO	CUMENTS	
Examiner Initials*	Cite No. ¹	Document Number Number-Kind Code ^{2(if} known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	001	US5818813	10-06-1998	SAITO; Masafumi et al.	
	002	US5973638	10-26-1999	ROBBINS; David F. et al.	
	003	US6097771	08-01-2000	FOSCHINI; Gerard Joseph	
	004	US6115354	09-05-2000	WECK; Christfried	
	005	US6141542	10-31-2000	KOTZIN; Michael D. et al.	
	006	US6317612	11-13-2001	FARSAKH; Christof	
	007	US6345036	02-05-2002	SUDO; Hiroaki et al.	
	800	US6492942	12-10-2002	KEZYS; Vytas	
	009	US6545997	04-08-2003	BOHNKE; Ralf et al.	
	010	US6597682	07-22-2003	KARI; Hannu	
	011	US6728233	04-27-2004	PARK; Jin-Soo et al.	
	012	US6785513	08-31-2004	SIVAPRAKASAM; Srinivas	
	013	US6990059	01-24-2006	ANIKHINDI; Santosh et al.	
	014	US6992972	01-31-2006	VAN NEE; Richard	
	015	US7006483	02-28-2006	NELSON; Jr. George Rodney et al.	
	016	US7009931	03-07-2006	MA; Jianglei et al.	
	017	US7068628	06-27-2006	LI; Ye et al.	
	018	US7492737	02-17-2009	FONG; Mo-Han et al.	
	019	US20020003774	01-10-2002	WANG; Zhaocheng et al.	
	020	US20020064214	05-30-2002	HATTORI; Toshihiro et al.	
	021	US20020184453	12-05-2002	HUGHES; Suzanne M. et	

^{*}EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant: Applicant's unique citation designation number (optional). 2
See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. 3 Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). 4
For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. 5Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. Applicant is to place a check mark here if English language
Translation is attached. This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND

TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute	e for form 1449/PTC)			Complete if Known		
Caponaia	7101101111111111011110	•		Application Number	10/693,429		
INFOR	RMATION D	ISCLOS	URE	Filing Date	2003-10-23		
STAT	EMENT BY	APPLIC	ANT	First Named Inventor	WALTON, J. Rodney		
(1100.00	many sheets as ne			Art Unit	2467		
(Ose as	: many sneets as ne	cessary)		Examiner Name	MARCUS SMITH		
Sheet	2	of	7	Attorney Docket No: 030417			

			U.S. PATENT DO	CUMENTS	
Examiner Initials*	Cite No. ¹	Document Number Number-Kind Code ^{2(if} known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
				al.	Арреаі
	022	US20020191535	12-19-2002	SUGIYAMA; Takatoshi et al.	
	023	US20030012308	01-16-2003	SAMPATH; Hemanth T. et al.	
	024	US20030128656	07-10-2003	SCARPA; Carl	
	025	US20040071104	04-15-2004	BOESEL; Robert W. et al.	
	026	US20040160987	08-19-2004	SUDO; Hiroaki et al.	
	027	US20040203853	10-14-2004	SHEYNBLAT; Leonid	

		F	OREIGN PATENT D	OCUMENTS		
		Foreign Patent Document	Publication		Pages, Columns, Lines, Where	
Examiner Initials*	Cite No. ¹	Country Code ³⁻ Number ⁴⁻ Kind Code ⁵ (if known)	Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Relevant Passages or Relevant Figures Appear	T 6
	028	AU2002259221	11-25-2002	QUALCOMM INC.		
	029	CN1489836A	04-14-2004	MATSUSHITA ELECTRIC IND. CO., LTD.		⊠
	030	EP0762701A2	03-12-1997	ADVANCED DIGITAL TELEVISION BR [JP]		
	031	EP0929172A1	07-14-1999	LUCENT TECHNOLOGIES INC [US]		

^{*}EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant: Applicant's unique citation designation number (optional). 2
See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. 3 Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). 4
For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. 5Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. Applicant is to place a check mark here if English language
Translation is attached. This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND

TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute	for form 1449/PTC)			Complete if Known			
				Application Number	10/693,429			
INFOR	MATION D	ISCLOS	SURE	Filing Date	2003-10-23			
STATE	EMENT BY	APPLIC	CANT	First Named Inventor	WALTON, J. Rodney			
(1100.00	many sheets as ne	20000011		Art Unit	2467			
(Ose as	many sneets as ne	cessary)		Examiner Name	MARCUS SMITH			
	_	_	_					
Sheet	3	of	7	Attorney Docket No: 030417				

		F	OREIGN PATENT I	OCUMENTS		
Examiner Initials*	Cite No.1	Foreign Patent Document Country Code ³⁻ Number ⁴⁻ Kind Code ⁵ (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T
	032	EP1061446	12-20-2000	SUN MICROSYSTEMS, INC.	7.555	
	033	EP1185015	03-06-2002	ALCATEL (FR)		
	034	EP1265411	12-11-2002	SONY DEUTSCHLAND GMBH.		
	035	EP1315311A1	05-28-2003	FUJITSU LTD [JP]		
	036	EP1379020	01-07-2004	NATIONAL UNIVERSITY OF SINGAPORE.		
	037	EP1387545A2	02-04-2004	SAMSUNG ELECTRONICS CO LTD [KR]		
	038	EP1556984A2	07-27-2005	QUALCOMM INC [US]		
	039	GB2373973A	10-02-2002	TOSHIBA RESEARCH EUROPE LIMITED.		
	040	JP03104430	05-01-1991	NIPPON TELEGRAPH & TELEPHONE.		⊠
	041	JP09327073	12-16-1997	N T T IDO TSUSHINMO KK.		⊠
	042	JP1028077	01-27-1998	SATO TAKURO WATANABE SOICHI ABE TAKEO.		×
	043	JP10327126	12-08-1998	LUCENT TECHNOLOGIES, INC.		×
	044	JP11252037A	09-17-1999	LUCENT TECHNOLOGIES INC .		×
	045	JP2000092009A	03-31-2000	SONY CORP.		⊠
	046	JP2001231074	08-24-2001	NORTEL NETWORKS LTD.		×

^{*}EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant's unique citation designation number (optional). 2 See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). 4 For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. skind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. Applicant is to place a check mark here if English language Translation is attached. This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND** TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute	for form 1449/PTC)			Complete if Known		
				Application Number	10/693,429		
INFOR	RMATION D	ISCLOS	SURE	Filing Date	2003-10-23		
STAT	EMENT BY	APPLIC	CANT	First Named Inventor	WALTON, J. Rodney		
// loo or	many sheets as ne	20000011		Art Unit	2467		
(Ose as	many sneets as ne	ecessary)		Examiner Name MARCUS SMITH			
Sheet	4	of	7	Attorney Docket No: 030417			

		F	OREIGN PATENT D	OCUMENTS		
Examiner Initials*	Cite No.1	Foreign Patent Document Country Code ³⁻ Number ⁴⁻ Kind Code ⁵ (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T
	047	JP200186045	03-30-2001	LUCENT TECHNOLOGIES, INC.	1.466.500	⊠
	048	JP2002111627	04-12-2002	SONY INTERNATL EUROP GMBH.		⊠
	049	JP2002164814	06-07-2002	NIPPON SOKEN et al		⊠
	050	JP2002204217	07-19-2002	NTT DOCOMO INC.		⊠
	051	JP200264879	02-28-2002	SK TELECOM CO LTD.		×
	052	JP200277098	03-15-2002	MITSUBISHI ELECTRIC CORP.		Ø
	053	JP200277104	03-15-2002	MITSUBISHI ELECTRIC CORP.		×
	054	JP2003504941	02-04-2003	SAMSUNG ELECTRONICS CO LTD.		⊠
	055	JP9266466A	10-07-1997	SUMITOMO ELECTRIC IND LTD.		×
	056	JP9512156T	12-02-1997	KONLE TILMAR [DE]		⊠
	057	KR1020020003370	01-12-2002	NTT DOCOMO, INC.		
	058	KR20060095576A	08-31-2006	QUALCOMM INC.		
	059	RU2141168C1	11-10-1999	MOTOROLA LTD.		×
	060	RU2149509	05-20-2000	QUALCOMM INCORPORATED.		×
	061	RU2335852C2	10-10-2008	QUALCOMM INC.		×
	062	WO02065664A2	08-22-2002	QUALCOMM INC [US]		
	063	WO02082689A2	10-17-2002	MOTOROLA INC [US]		
	064	WO02099992A1	12-12-2002	QUALCOMM INC [US]		

^{*}EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant: 1 Applicant's unique citation designation number (optional). 2

See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. 3 Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). 4

For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. 5kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. 6 Applicant is to place a check mark here if English language

Translation is attached. This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

(000 40	, 5.75010 40 770			Examiner Name	Examiner Name MARCUS SMITH		
(Use as	many sheets as ne	cessarv)		Art Unit	2467		
STATEMENT BY APPLICANT				First Named Inventor	WALTON, J. Rodney		
INFOR	RMATION D	ISCLOS	URE	Filing Date	2003-10-23		
				Application Number	10/693,429		
Substitute	for form 1449/PTC)			Complete if Known		

		F	OREIGN PATENT D	OCUMENTS		
Eveninen	Cito	Foreign Patent Document	Publication	Name of Patentee or	Pages, Columns, Lines, Where Relevant	
Examiner Initials*	Cite No. ¹	Country Code ³⁻ Number ⁴⁻ Kind Code ⁵ (if known)	Date MM-DD-YYYY	Applicant of Cited Document	Passages or Relevant Figures Appear	T 6
	065	WO03028153A1	04-03-2003	ARRAYCOMM INC [US]		
	066	WO03047140A1	06-05-2003	FUJITSU LIMITED.		
	067	WO04002047	12-31-2003	QUALCOMM INC [US]		
	068	WO199809395	03-05-1998	THE BOARD OF TRUSTEES OF THE LELAND STANFORD JUNIOR UNIVERSITY,US.		
	069	WO2004002011	12-31-2003	QUALCOMM INCORPORATED.		
	070	WO9824192A1	06-04-1998	TRW INC [US]		

	NON PATENT LITERATURE DOCUMENTS							
Examiner Initials* Cite No. Include name of the author (in CAPITAL LETTERS), title of the article (when approp of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s issue number(s), publisher, city and/or country where published.								
	071	DIGGAVI, S. et al., "intercarrier interference in MIMO OFDM," IEEE International Conference on Communications, 2002, Vol. 1, 485-489.						
	072	ISERTE et al., "Joint beamforming strategies in OFDM-MIMO systems," 2002, sections 2 and 3, Department of Signal Theory and Communications.						
	073	LEBRUN G., et al., "MIMO transmission over a time varying TDD channel using SVD," Electronics Letters, 2001, Vol. 37, 1363-1364.						
	074	LI et al., "Simplified Channel Estimation for OFDM Systems with Multiple Transmit Antennas," IEEE Transactions on Wireless Communications, January 2002, Vol. 1, No. 1,						

^{*}EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant: 1 Applicant's unique citation designation number (optional). 2

See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. 3 Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). 4

For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. 5kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. 6 Applicant is to place a check mark here if English language

Translation is attached. This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND

TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449/PTO				Complete if Known		
				Application Number	10/693,429	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use as many sheets as necessary)				Filing Date	2003-10-23	
				First Named Inventor	WALTON, J. Rodney	
				Art Unit	2467	
				Examiner Name	MARCUS SMITH	
Sheet 6 of 7 Attorney Docket No: 030417						

NON PATENT LITERATURE DOCUMENTS								
Examiner Initials*	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.						
		67-75.						
	075	SAMPATH H., et al., "Joint transmit and receive optimization for high data rate wireless communication using multiple antennas, XP010373976," 2002, 215-219.						
	076	WONG K. K., et al., "Optimizing time and space MIMO antenna system for frequency selective fading channels," 2001, Sections II and III and V, 1396.						

^{*}EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant: Applicant's unique citation designation number (optional). 2
See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. 3 Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). 4
For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. 5Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. Applicant is to place a check mark here if English language
Translation is attached. This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND

TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.